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THE VENEREAL CLINIC.

By

V. V. WOOD, Acting Assistant Surgeon, U. S. Public Health Service in Charge of Clinic No. 5.

A free clinic for venereal diseases was opened by the United States Government in El Paso on the first of February. It is under the auspices of the Public Health Service, with Dr. J. W. Tappan as Director. Such clinics are being established wherever needed in all cities adjacent to the large cantonments and mobilizing sites of the army. The reason for such a move is evident, namely the prevalence of immorality in the army and extra-cantonment areas. Such a condition has usually made itself manifest during times of war, and the present one is no exception. The increase of venereal diseases has been one of the most serious problems of the management of our armies. The work being new, there are many perplexing problems constantly arising. A general outline of the plan was sent from Washington, but the active and effective execution of it has presented many difficulties. The means of finding foci of infection and bringing them to the clinic was the first problem. It was arranged to inspect all occupants of the city and county jails and other places of detention of questionable characters. All other such cases suspected were ordered to report to the clinic for inspection. All prisoners released and of known character were ordered to report back for inspection once a week. The police records were searched for past performers and their whereabouts looked into.

Nurses and policewomen were employed by the clinic to search out suspected cases, and inspect dance halls and questionable hotels. All social organizations and charitable societies were asked to lend aid in the form of information as to likely subjects. It was attempted to trace the source of infection of all active cases and especially to try to obtain through the army officers where each man contracted his disease. Patients coming to the clinic were urged to send in their friends. Many business firms were asked to furnish information regarding the character of their employees. Cards were sent to local physicians to report cases under their treatment, but by number only, which should correspond to a private record in the office. We sought to bring in many cases voluntarily by advertising the purpose, location and hours of the clinic through the public

press, stickers put up in lavatories and other suitable places, and very complete educational pamphlets telling much about the subject.

The means of obtaining attendance at the clinic adopted were first lenient and kindly treatment of all voluntary cases except those highly contagious, which it was thought should be confined, and arrangements to take care of these in the county hospital and in the city and county jails. However we used every means possible to gain their confidence and co-operation. Those not amenable to such treatment were quickly shown that there was no choice.

A complete follow-up system was instituted and we had cards on file, according to the day of the month the patient was told to return, and if she did not come on that date a nurse or policewoman was put upon her trail and the search continued until she was found and brought to the clinic for treatment, or detention in the hospital, until her infectiveness was over.

As to treatment the gonorrhœal cases offered the greatest difficulties, owing to the long persistence of infection in spite of treatment. Here it was necessary to consider forcible confinement. The syphilitic cases could usually be made non-infectious in ten days. These cases were then usually turned over to a private physician if they were able to pay for treatment. We have made an earnest effort to prevent imposition on the clinic and on private physicians, and have had no opposition from the medical profession. The results have already been better than we expected.

We have heard but one argument against such a clinic, namely the false sense of security likely to arise in the minds of the laity, thus increasing immorality. This should be overcome by education showing that the work is not infallible, as any woman may be in the incubation stage when examined and break out the next day, or she may be infected soon after examination.

It was decided that the highest efficiency of such a move could not be attained unless it was thoroughly understood by the patients that our work was merely for the betterment of their health and not connected with a clean-up or reform movement, not that we do not approve of such measures but because we felt that best results could be obtained by not trying to force such steps into our work. We also felt that the greatest possible success of such a clinic could not be attained without the fullest co-operation upon the part of the city and county authorities and organizations interested in social service work and public health and welfare.

In answer to the question as to whether or not such a move is worth while, it seems that it is so a thousand times over. If an infectious woman can serve twenty-five or thirty men in twenty-four hours, as it has been proved she often does, then suppose for only one day be cut off of her infectious career, cannot anyone see what an inestimable amount of suffering may be saved? See what a large amount of benefit the human race has derived from that one day's work. No one but an idealist will expect such a movement to reach all the infectious women in a given community, but it is easy to see that much good should result.

EPIDIDYMOTOMY FOR GONORRHEAL EPIDIYMITIS.

By
LIEUT. F. C. PARROTT, M. R. C.

Read before the El Paso County Medical Societ y, March 4, 1918.

MR. CHAIRMAN AND GENTLEMEN:

In presenting this paper for your consideration I wish to say that I will not make any reference to my genito-urinary experience in civil life. My conclusions are based upon results obtained from patients coming under my observation for treatment since I have been Chief of the Genito-Urinary Service at the Base Hospital, Fort Bliss, Texas. During the last sixty days I have had one hundred thirty gonorrheal cases; out of that number that developed epididymitis, were ten right-testicle non-suppurative, five left non-suppurative, six left suppurative, one bilateral non-suppurative. Only three developed after they came into the hospital. In the bilateral cases the right testicle suffered first attack, five days later.

ANATOMY:

The testicles are two ovoid glandular organs which are suspended in the scrotum by the spermatic cords, each one in a chamber of its own, each testis is made up of two parts, testicle proper and the epididymis. The latter transmits the spermatozoa, the former produces them. The coverings of the testicle are the tunica vaginalis and tunica albuginia. The tunica vaginalis is derived from the peritoneum and has two layers, one covering the testicle, the other reflected on the scrotum. The epididymis occupies the upper and posterior border of the testicle; it begins where the vasa efferentia pass through the tunca albuginia, then becomes larger and forms the globus major, the parts between the rete and globus major form the coni vasculosi and empty into one canal which is the canal of the epididymis, the body of the organ. The epididymis is connected to the testicle by the tunica vaginalis. The tail of the globus minor is convoluted and the vasa deferens begins in it. The blood supply is from the spermatic artery, a branch of the aorta. The vasa deferens is a continuation of the canal of the epididymis above the posterior border of the prostate, it is joined by the seminal duct forming the ejaculatory duct which opens below the end a little to either side of the veramontanum and the prostatic urethra.

Epididymitis is more often met with than any other testicular trouble and is extremely liable to destroy the functional power of the testicle by closing up the canal. It is stated by good authority that simultaneous bilateral epididymitis does not occur. I have never seen a case. It is the inevitable result of post urethral inflammation, I think absolutely gonorrheal. Most of my cases occurred during the second week of acute gonorrhea. I have seen some develop acute epididymitis two weeks after an acute gonorrhea. In the acute case the inflammatory process begins in

the tail of the epididymis, then travels to the head. If the inflammation continues, the whole appendage becomes involved including the tunica vaginalis proper, then the parietal layer of the scrotum, which ultimately results in an acute hydrocele.

SYMPTOMS.

The symptoms are pain, heat, swelling, and tenderness. If the testicle is left hanging the pain is more severe and a sickening feeling is experienced by the patient; standing or walking is exceedingly painful, and slight temperature is seen in the acute stage. Pain is also reflected up the cord, possibly due to weight.

TREATMENT—NON-OPERATIVE.

Treatments are operative and non-operative. The non-operative consists of putting the patient to bed, flushing his bowels out with salts, light diet, applying locally lead and opium pack to the scrotum, and elevating testicles with T-bandage, relieving tension on the cord. With this treatment in a great many cases you get fair results, but it is a long drawn out affair, and relapses occur in over 50 per cent. of cases.

OPERATIVE.

Epididymotomy gives instant relief from pain, all symptoms subside in four to five days—shorter disability. Out of thirty-five cases operated upon there were no relapses or trouble of any kind. I prefer the operative treatment, because it gives me better results than the non-operative treatment.

When a patient comes to me I put him to bed after he has had a good bath, order the Medical Department man to shave him and prepare for an epididymotomy. I do not believe in external applications or expect treatments to effect a cure. It is a surgical disease. I have operated on every case that came under my observation with perfect results. After operation they suffer no pain, the temperature subsides and the inflammation rapidly gives way and he leaves his bed on the fifth day. On about the tenth day I put his scrotum in a suspensory bandage and send him to duty if he is well of his gonorrhea. After operation I put the patient to bed, apply wet bichlor-merc-dressings, supporting testicles with a T-bandage.

EPIDIDYMOTOMY.

Make an incision three inches long in the middle line of the anterior surface of the scrotum. The incision is carried down to the tunica vaginalis. Break up any adhesions between the sac and parietal wall, open the sac, bring out the testicle, evert the tunica vaginalis and be sure to split it from end to end and bring the layers behind the epididymitis and cord and suture the two cut edges together; this will cure your hydrocele. Now the epididymis is examined; you find at the globus minor to be thickened, infiltrated and swollen tissue; plunge atonotome deep into the infiltrated tissue, make two or three punctures, if need be; then take a small hemo-

stat, push down into the wound and spread the blades. This will enlarge the wound. If the globus major is involved, do likewise with it, then place small rubber drain tube and anchor it in position with the suture, close the dortus with a continuous suture, the skin with interrupted sutures and apply your dressing; remove drainage tube within forty-eight hours.

In conclusion I think—

(1) Every case of epididymitis is produced by gonorrheal infection of the posterior urethra;

(2) I think it is a surgical disease and should be treated as such;

(3) I think epididymotomy is the operation that will give the best results, giving shorter disability and permanent cure.

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MALIGNANCY OF OVARIAN CYSTS.

By
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The liability of malignancy in ovarian cysts is apt to be regarded entirely too lightly by the surgeon of small experience with these growths. The author well remembers how astonished he was when he heard Prof. Shauta say at his clinic in Vienna that 20 per cent. of ovarian cysts are malignant. This was early in our surgical experience, when we had never seen an ovarian cyst case do otherwise than perfectly. Nevertheless 20 per cent. of these growths are malignant and will recur unless properly removed.

A large experience and a careful following-up of patients will reveal that ovarian cyst malignancy is a real danger. This danger is especially great in cysts which have either ruptured or leaked into the peritoneal cavity and thereby caused numerous adhesions.

Although 20 per cent. of these growths are malignant, early and careful removal will reduce recurrence to one per cent. or even less. Yet no surgeon of considerable experience has been fortunate enough not to have lost some patients from malignant ovarian cysts.

Parovarian cysts which comprise about 10 per cent. of all ovarian and parovarian cysts are least malignant of these growths, and are usually unilocular, containing a clear fluid. Ovarian cysts in 20 per cent. or over are potentially malignant; are nearly always multilocular, having numerous glandular trabeculae and contain a thick mucoid material, varying in color from clear mucus to a dirty dark brown. They are all rich in glandular tissue, but those containing the most glandular papillae are most dangerous.

Malignant ovarian cysts may be divided into:—

1. Adenocystomata
2. Adenocarcinomata
3. Mixed-carcinoma and sarcoma.

ADENOCYSTOMATA.

This is the ordinary ovarian cyst, and is potentially malignant only. Its recurrences are almost all together within the peritoneum. These grafts are caused by the escape of the cyst contents into the peritoneum, due either to a rupture or leaking of the cyst, or soiling the peritoneum with cyst contents during careless removal. Those cysts that rupture or leak prior to removal are most liable to form these secondary grafts. Such cysts are of a low grade of malignancy, and numerous recurrences have been removed with apparent, and sometimes permanent recovery.

Metastases from these cysts rarely occur outside of the peritoneum, but there are rare exceptions as shown by case 5 here reported.

Dermoid cysts are notoriously non-malignant, but even dermoid upon rupture have been known to form numerous peritoneal grafts.

ADENOCARCINOMATA.

This is the genuine active cancer of the ovary, and they are both cystic and solid. Primarily, this growth of the ovary is rare, but secondary to carcinomas of the stomach, intestine, gall bladder and liver it is not uncommon. This growth *is so rare primarily that whenever it is found, the primary carcinoma in the stomach bowel or liver should be carefully* sought for. The cystic form is of extremely rapid growth, causes, as a rule, numerous adhesions to the intestines, and is of great toxicity, the patient going down rapidly during its growth.

MIXED ADENOCARCINOMA AND SARCOMA.

This growth is rare. The tumor is usually soft and extremely friable. In the case here reported, the bilateral tumor was almost the consistency of fresh cerebral tissue. The growth shows round-celled sarcoma in portions, and adenocarcinoma in others.

Adenocarcinomata, mixed-adenocarcinoma and sarcoma, occur bi-laterally far more frequently than do the adenocystomata. So frequently does this occur that many authorities advocate removal of both ovaries. This should certainly be done when the other ovary is the least suspicious. Recurrence in the uterus or broad ligaments is certainly very rare, if at all.

Our own personal experience has very forcibly impressed upon us the danger of malignancy in even innocent-looking comparatively small ovarian cysts. We have seen seven cases of recurrence: five are dead and two recent cases are still under observation. Five are here briefly reported, four of our own, and one of Dr. K. D. Lynch, of this city, to whom I am indebted for the report.

Case I. Mrs. C., age 42, gave the history of having a simple ovarian cyst of the left ovary, removed three years previously. Recovery was easy

and apparently perfect. Two and a half years later she was so sick that she consented to have the abdomen opened. The anterior abdominal peritoneum was attached to the omentum and intestines, beneath by a carcinomatous cementing of the whole. Little exploration could be done, on account of furious bleeding and it was at once apparent that nothing could be done save cut away a specimen for examination. This showed, by microscopic examination, typical adenocarcinoma.

The patient died a few weeks later.

Case II. Mrs. Y., age 36, was operated upon by us in July, 1916, after she had an obstruction of the bowel for several days, and was greatly distended, so that exploration was extremely difficult and the obstruction could not be found. The cecum was opened and the bowel drained. Later the obstruction was found to be a carcinoma of the colon at the splenic flexure. This was removed and the patient recovered after another operation one week later for obstruction of the small intestine, due to toxic adhesions. The colon anastomosis was found perfect. The patient then stayed well till the middle of September, 1917.

In the middle of August, 1917, the patient was looked over by her physician, who made a pelvic examination at that time, and the right ovary was normal and the left ovary hardly enlarged at all. About the middle of September she began to have distress in the lower abdomen and felt a small "lump" in the lower left-hand quadrant of the abdomen. The patient grew steadily worse and on September 26th she was seized with violent pain in the abdomen, followed by nausea and vomiting. She was sent to the hospital September 28th but her condition was so bad that an operation was thought useless. The abdomen was greatly distended and a firm tumor in the left hand lower quadrant of the abdomen was easily felt. This was thought to be a recurrence of the carcinoma of the splenic flexure of the colon, removed fourteen months previously. The patient was given plenty of morphine for the pain, and enemas to move the bowels. The bowels were gotten to move slightly almost daily, but the patient continued in such bad condition she was expected to die any time.

October 14th we were called to see the patient and found her in extreme condition. She had vomited continually since her initial onset of obstruction September 26th, and was emaciated; pinched expression of face and asking for nothing but to die. A large fixed and firm tumor was felt in the lower left abdomen extending above the umbilicus and reaching almost to the ilium on the right side. The kidneys were secreting only about 10 oz. per day.

Although the patient vomited from five to thirty times each twenty-four hours, by means of proctoclysis and reducing the morphine and rectal feeding she was kept alive, and the kidneys improved somewhat.

Ten days after we had taken charge of the patient she continued to vomit and it seemed impossible to improve her condition to any considerable extent. The patient was just living and that was all. It being im-

possible to give ether, Dr. K. D. Lynch kindly gave her spinal anaesthesia and assisted me at the operation.

The tumor was found to be an adenocarcinoma of the left ovary, weighing six or seven pounds, and extremely adherent to the intestines. These adhesions and pressure caused the initial symptoms of acute obstruction and succeeding partial obstruction. The tumor is a typical cystic adenocarcinoma of the ovary, and was so very friable that it could not be removed as a whole but tore into several pieces on being stripped from its bed.

The intestines at points of adherence to tumor were badly matted together and an enormous amount of plastic work had to be done in separating the intestines and covering the worst raw surfaces with peritoneum. The abdomen was closed with drainage.

No recurrences had taken place in the intestines and the anastomosis of the colon at the site of the removal of the original carcinoma was apparently perfectly free from cancer. The right ovary and tube were perfectly normal and were not removed. But at the time of operation, fourteen months ago, both tubes and ovaries were apparently normal.

The spinal anaesthesia worked wonderfully. The anaesthetic was perfect and there was no shock. While separating the adhesions the patient's bowels moved well on the table and she was able to take water right after going to bed.

This is the twelfth day after operation, and the patient has not vomited or been nauseated since. Bowels move well every day and patient is apparently going to recover.* Wound has healed perfectly except drainage tract.

It is a question whether this tumor is secondary to the growth removed a year ago or whether it is entirely independent. It is probably secondary to the intestinal growth, although the affected ovary appeared perfectly normal fourteen months previously.

Case III. Woman, aged 42, gave history of good health till three months prior to examination. Since that time she has lost thirty pounds in weight and for two or three weeks has had some pain in the lower abdomen.

Examination revealed two mushy feeling masses on either side of the uterus. Uterus was normal.

Operation revealed two ovarian tumors of brain like softness and color with areas of fine cystic locules. The tumors were very friable, but there were few adhesions and easily removed.

Areas showed round celled sarcoma and cystic portions, the most virulent looking adeno-carcinoma.

The patient made an easy recovery and was given many doses of Coley's fluid (Streptococcus and B. Prodigiosus). She gained forty-five pounds and looked the picture of health three years later when last seen by

* Patient made a good recovery, and is now (March 1st, 1918) apparently well.

us; she then went to East Texas to live and one year later I heard she was dead; that she had died of cancer of the right lung, so I was told, but could never verify cause of death.

Case IV. Mexican woman, age 42. Eleven months ago began to have dull aching pain in pelvis on left side. Three months later she began to have increasing bladder irritability. No hematuria, but marked frequency and pain.

Two months ago the abdomen began to swell and increased to present size—fifty-six inches.

Examination revealed a small tumor to either side of fixed uterus. Tumors had the feel of adenocystomata floating in fluid.

Operation—Fluid aspirated before peritoneum was opened. Tumor graft nodules were found on peritoneum, liver, spleen, kidneys and intestines.

The bilateral ovarian tumors were gelatinous in appearance and adherent to the uterus, tubes and bladder. Supravaginal hysterectomy, with the ovaries and tubes attached, was performed. The ovaries were cystic masses; the right one was intact, but the left was broken open and a large cauliflower mass protruding. Both were found to be adenocarcinomata.

Two months later—No recurrence of ascites. Cystoscope now shows no involvement of the bladder wall. Pain and all symptoms relieved.

Case V. Woman, age 56, was operated on in February, 1898, in Chicago for an ovarian cyst of the right side.

According to the history written at the time, the tumor was carcinoma with purulent areas and could not be removed on account of adhesions. The contents were removed and the cyst wall sewed into the abdominal wound and drained. Four months later the patient was able to leave the hospital. There remained a small tumor in the right side, which did not increase in size till about six years ago, when the patient went to a famous clinic for operation on a hernia and the tumor. The tumor had become a hard fixed mass in the hollow of the right ilium. The hernia was closed but the surgeons declined to molest the tumor, and we can well judge by what we found later, that the fixed hard tumor was regarded as a sarcoma.

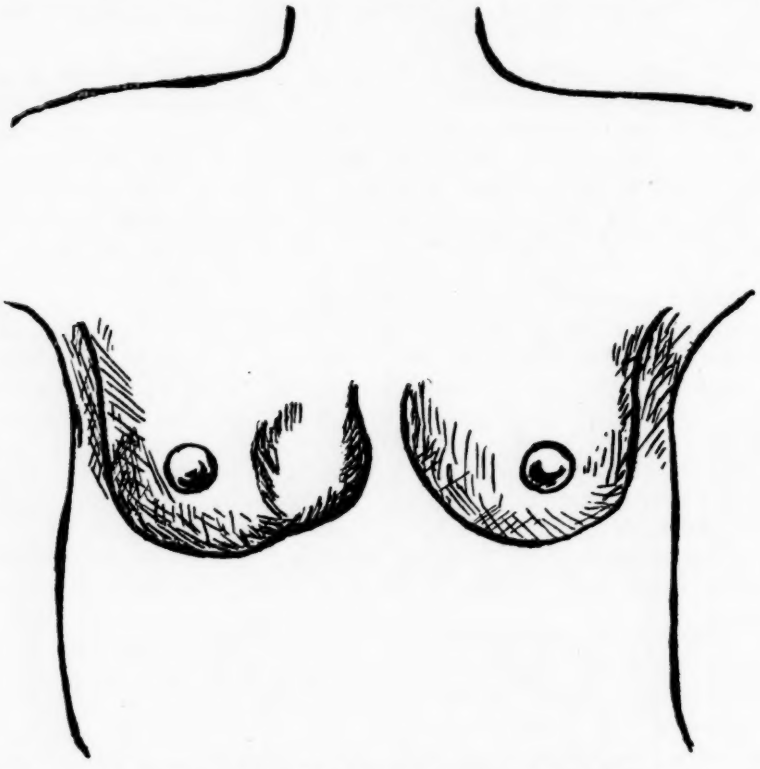
Sixteen years after the Chicago operation the patient noted a small swelling just to the right of the sternum, and at the lower internal quadrant of the right breast. A few months later this had increased to the size of an orange. A surgeon was called and at operation the growth was found to be a multilocular cyst, which had pushed its way out through the ribs from somewhere within the chest. The operation was stopped at this point and the wound closed.

A few weeks later the growth reappeared.

In November, 1916, we were called to see the patient, and obtained the history here written with the addition that the patient had been a semi-invalid for the past eighteen years, and for five years past had suf-

fered with ever increasing pain in the right inguinial region and down the right leg. She had during all this time suffered from severe and increasing constipation till it was now very marked obstipation. She had taken considerable morphine and now the pain was so severe she could not lie down at night.

Examination showed a rather fleshy woman with a hard, fixed eliptical tumor, hugging close to the hollow of the right ileum. The tumor was about the size of a cocoanut with its shell and was not tender to pressure. The right leg was swollen double the size of the left and very painful, but not on pressure. It was evident that the swelling and pain were due to pressure of the tumor. The rest of the examination was negative, except a tumor in the left lower quadrant of the right breast, described above.



Cut 1, Case 5. Shows metastatic adenocarcinoma of the mediastinum,—as the portion of tumor projecting through the ribs looked before operation.

This tumor was again about the size of an orange, soft and fluctuating and not painful.

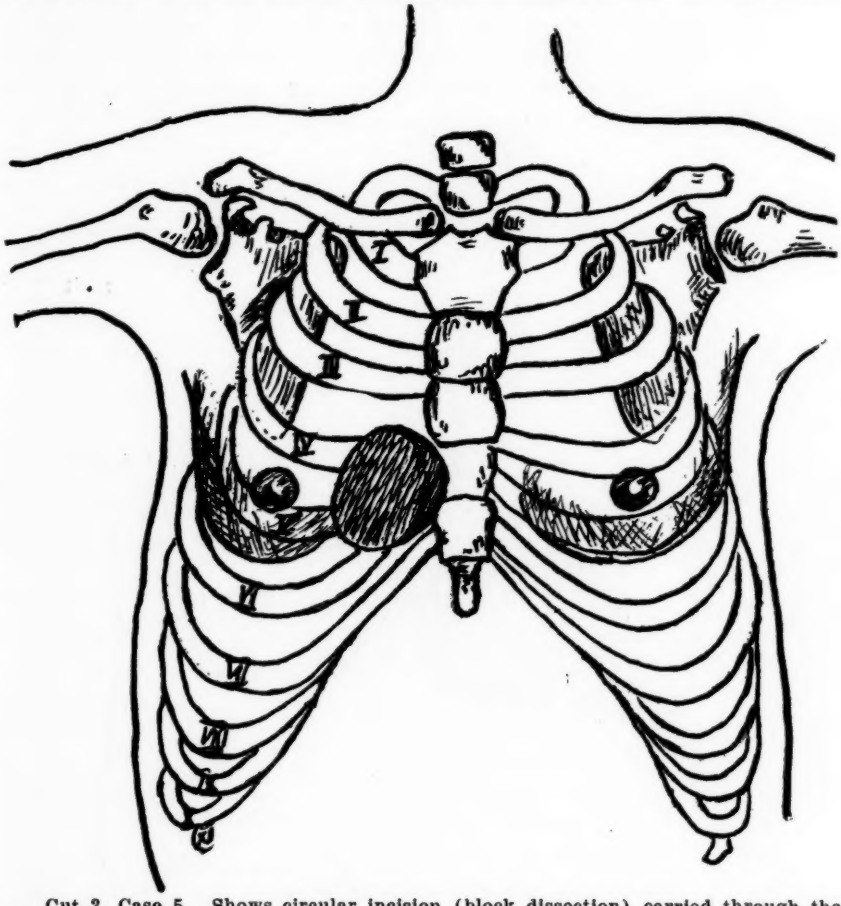
The patient was suffering so much that something had to be done.

This iliac tumor had the feel and action of a sarcoma. Yet there was the history of the drained ovarian cyst; but what would an ovarian cyst be doing, hugging the ilium and fixed immovably in this favorite site for a sarcoma?

We attempted to have the right ureter catheterized to mark its location, but the bladder was so twisted out of shape that the ureteral orifice could not be found.

The tumor proved to be an interligamentous multilocular ovarian cyst, evidently the interligamentous portion of the cyst drained eighteen years before.

This was the most difficult operation we ever performed. The cyst lay partially within the broad ligament and was one mass of dense fibrous



Cut 2, Case 5. Shows circular incision (block dissection) carried through the ribs and right side of sternum. Tumor was attached to pericardium and right pleura.

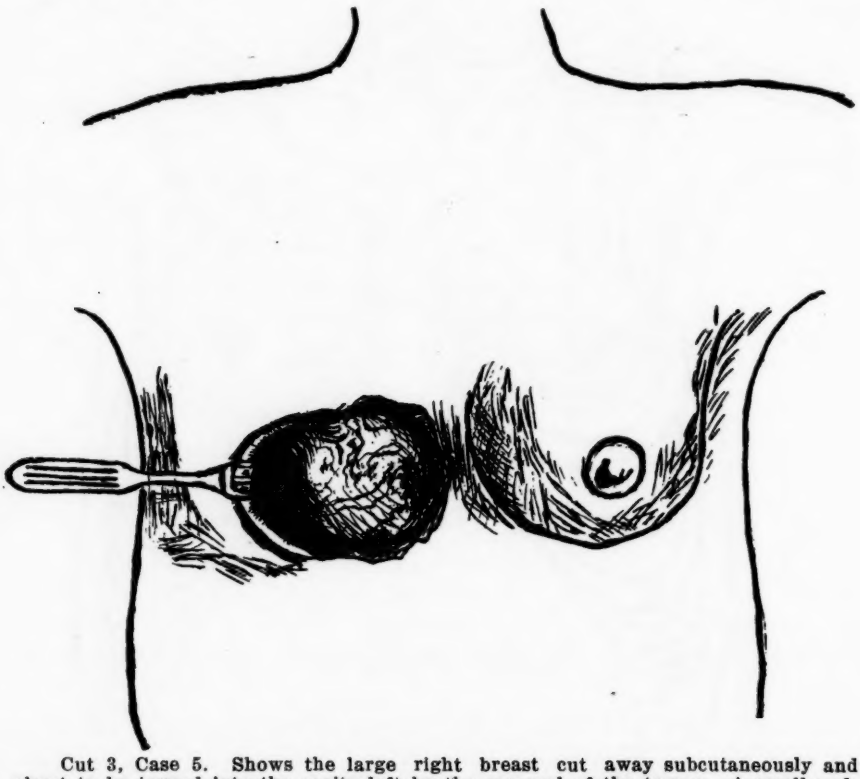
adhesions. There was no such thing as a line of cleavage—everything had to be cut and torn. Finally the tumor was completely removed. The bladder was distorted into all kinds of crypts and pockets. We tore into one of them, but closed the rent with catgut.

We separated the tumor with great difficulty from the external iliac artery and vein; being fortunate enough not to tear them.

The whole lower abdomen was a mass of adhesions, but we separated the coils of intestine that were in contact with the tumor only leaving the rest for some other time.

The patient made a slow recovery and in five weeks was able to be about a little. The pain left the right leg shortly after the operation, and the swelling was mostly gone at the end of five weeks.

Eight months later we were called again to see the patient, on account of the growth of the chest tumor, and embarrassment of the heart action. The patient said it gave her smothering sensations at times as though she were going to faint.

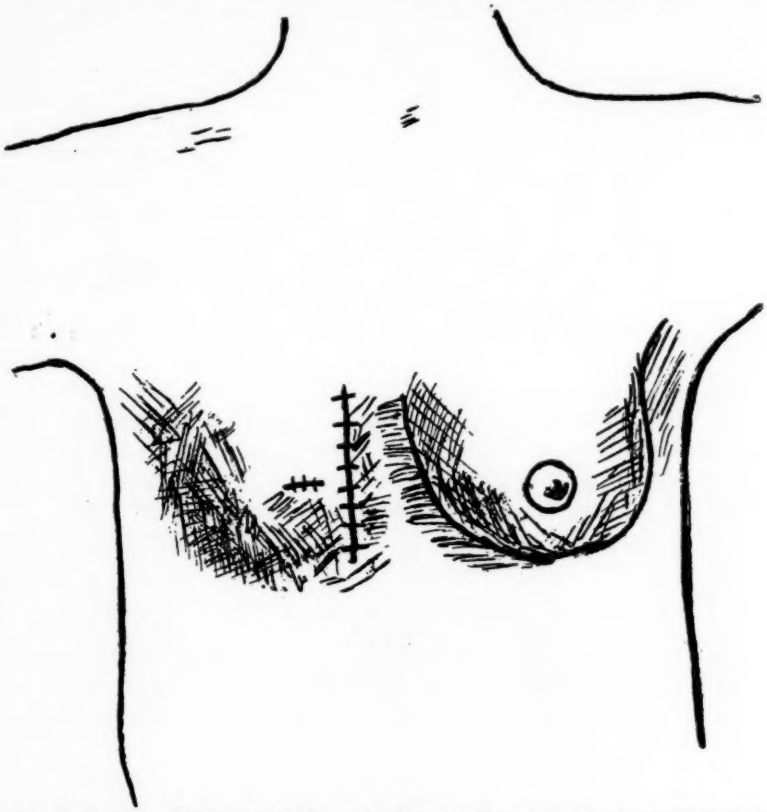


Cut 3, Case 5. Shows the large right breast cut away subcutaneously and about to be turned into the cavity left by the removal of the tumor. A small pedicle to the cut-away breast was left above to insure the vitality of the mass.

The tumor had grown considerably since we had last seen it, so we sent the patient back to the hospital. Considering the growth malignant, we made a block removal down to the ribs and removed this portion of the cyst. Dirty, dark brown cystic contents escaped from numerous worm-hole looking foramina in the fourth and fifth inter-spaces.

The incision was now carried through the fourth and fifth ribs. This incision made a circle about three inches in diameter, as shown in the illustration. The ribs were now raised up and separated at the sternum. This allowed a free flow of the cystic contents from below. About a pint of the same thick, dirty brown fluid escaped.

The right edge of the sternum, at the tumor area, was honeycombed



Cut 4, Case 5. Shows operation completed. The skin from over the removed breast covers in the large wound nicely. This drew the nipple so far to the mid line that it was removed for cosmetic effect.

by the cyst and was cut away for an inch and a half with bone forceps. This completed the circular incision. The chest wall was now taken out over the cyst in block, which gave an excellent exposure. The intrathor-

acic cyst lay within the mediastinum and had pushed the right pleura and overlying margin of the right lung well to the right, so there was plenty of room to work.

We now dissected out the cyst from the pericardium on the left and behind, and the pleura on the right. We now had a hole in the mediastinum about three or three and a half inches deep and three inches in diameter.

To fill in this hole we now cut away about two-thirds of the right breast, leaving an uncut pedicle above, and slid this portion of the fat breast into the hole which it filled nicely.

We had previously daubed iodine over the whole surface of the cavity and put in a drain coming out below the lower border of the wound.

The skin covering the portion of the breast cut away was now pulled over and sutured over the wound. This worked admirably, but the nipple had to be cut away because it was dragged to the left about four inches. The patient recovered. The wound healed kindly and the drain was removed at the end of a week.

Now, three months after the operation, there is no evidence of a return and no embarrassment of the heart action. The patient now gets about and is apparently well, except for the severe obstipation due to the intestinal adhesions in the lower abdomen.

Microscopic examination by Dr. Waite of the mediastinal tumor showed a typical adenocarcinoma of the ovarian type, and microscopically the tumor exactly resembled the cyst removed from the right broad ligament.

CONCLUSIONS.

(1) Since metastases and peritoneal graft recurrences are nearly always neglected cases, it follows that these cysts should always be removed early, before the cyst becomes large enough to reduce the patient's resistance by its toxines, or possibly rupture.

(2) The most scrupulous care must be exercised in removal to prevent the escape of cyst contents into the peritoneum. Soiling of the peritoneum by cyst contents is apt to be followed by graft recurrence.

(3) Spontaneous rupture is liable to occur in cysts of any considerable size—the most common cause of peritoneal graft recurrence.

LABORATORY STUDY OF CEREBRO-SPINAL FLUIDS.

By

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(Read before the Maricopa County Medical Society, Phoenix, Ariz., March 16, 1918.)

Although the cerebrospinal fluid has been utilized for diagnostic purposes for the past quarter of a century, during which time present laboratory methods have been largely developed, yet only within very recent years have examinations of this fluid received the attention which their importance deserves. In fact it has been rather recently that physiologists have given us a clear idea of the nature of this fluid and method of its formation. It has been spoken of as the lymph of the brain, giving a somewhat false idea of its character. Halliburton (1) has shown that the very essence of lymph is that it should be in free communication with the blood stream, except for an intervening membrane and that this membrane should be equally permeable to water and other substances in both directions. These essentials are lacking in regard to the cerebrospinal fluid, as it has been shown that the membrane lining the cerebrospinal spaces is permeable to substances passing from it into the blood, but impermeable in a reverse direction except for oxygen; and that the fluid is primarily the product of the secreting cells covering the choroid plexuses in the cerebral ventricles. This choroid "gland" exercises a very selective action on the substances which it admits, so that there is formed an ideal physiologic solution for the purpose of lying in continuous contact with the sensitive tissues of the nervous system. This selective action is especially noteworthy in reference to the almost complete exclusion of protein bodies. In the light of our present knowledge of protein substances we must consider this in the nature of a protective provision as it has been found that the nervous system is much more susceptible to the effect of toxic proteins than are other body tissues. In order to exclude harmful proteins, all such bodies are almost entirely excluded.

The credit of first withdrawing cerebrospinal fluid belongs to an American physician, Dr. Corning, who performed the puncture in 1885. In 1889 spinal fluid was withdrawn for the purpose of diminishing intracranial pressure, this being accomplished by the laborious method of doing a laminectomy. In 1891 Quincke presented his first paper on "The Technic of Lumbar Puncture and the Study of Cerebro Spinal Fluid" and the thoroughness with which he treated the subject justly led to his name being connected with the operation of lumbar puncture.

The purpose of withdrawing cerebrospinal fluid is usually to secure aid in diagnosis, though not uncommonly puncture of the spinal dura is made to introduce therapeutic agents in diseases involving the nervous system. The various tests and examinations developed render a study of this fluid of the greatest value in many systemc disorders and in some forms of meningeal involvement this study is almost imperative, if an early diagnosis is to be obtained.

The care of the fluid after withdrawal is of importance. In case a cell count is desired, this should be done in an hour or two. The addition of a few drops of formalin will preserve the cells fairly well, but may interfere with other tests. For the Wassermann reaction and colloidal gold test no preservative should be added.

Normally the fluid is transparent and colorless, with a specific gravity of 1003 to 1009. In a large percentage of pathologic fluids the color is unaltered, and the transparency undiminished. The transparency is at times reduced by cellular admixture, and this varies through all degrees of cloudiness. The specific gravity is increased in proportion to the cellular and protein increase. The only color change worthy of note is a yellow coloration occasionally observed. Sprunt and Walker (2) in an article on the significance of this xanthochromia say that these fluids are divided into two main groups: First, those in which the color is due to dissolved hemoglobin, which as a rule do not coagulate spontaneously and contain only a small amount of globulin. Such fluids are usually associated with brain tumors in contact with the meninges or ventricles. Second, the more important group are those cases showing the so called Froin's syndrome, the fluid transparent, yellow, coagulates spontaneously, contains large amounts of globulin and mayor may not show pleocytosis. This is the "cord compression syndrome" and probably indicates the isolation of a lumbar cul-de-sac in which the fluid stagnates.

The number of cells normally present in cerebrospinal fluid has been variously estimated, some workers placing eight to ten per cu. m. m. as the normal limit, others considering three to five as the normal, above five as pathologic. It is probably nearly correct to reckon five cells as the normal limit, with a border line count up to ten and distinctly pathologic above this number. However, in fluids showing other abnormal features, a count above five may be taken as additional evidence of abnormality. The number that may be found in pathologic states, varies from this limit to several hundreds or thousands. These excessive numbers are found in cases of acute meningeal involvement, while the lesser numbers are found in chronic types of infection and especially in syphilis of the nervous system. As a general statement, it may be said that the increase in cell counts goes hand in hand with the degree and acuteness of the meningeal involvement.

In the diagnosis of tuberculous meningitis Kasahara (3) has found that a specific focal reaction may be developed in these cases by an intra

spinal injection of 0.01 to 0.002 mg. of Koch's old tuberculin. The most conspicuous change in such a reaction is the increase in the cell count in six to twenty-four hours following the injection.

The form of cell present in syphilitic processes, poliomyelitis and tuberculous meningitis, is largely the small lymphocyte; in the acute meningeal forms the polymorphonuclear cell predominates.

In acute forms of meningeal infection a bacteriological examination is essential. When this is desired, the fluid must be collected in sterile test tubes in a manner free from liability of contamination. Primary acute meningeal infection is due chiefly to two microorganisms, the meningococcus and pneumococcus. Secondarily invading from other foci are found at times staphylococcus and streptococcus and cases of infection by the gonococcus and colon bacillus occasionally occurs. In tuberculous meningitis the demonstration of the causative organism may be a tedious, time consuming procedure, and finally result in failure. Animal inoculation may assist in demonstrating the tubercle bacillus.

Bacteriologic findings in the spinal fluid in cases of acute poliomyelitis have been universally negative, until the recent epidemics called out a great amount of investigation. As a result of his work in this line Nuzum (4) of Chicago reports isolation of a micrococcus, supposedly the causative agent, from the spinal fluid of 45 of 50 cases of acute poliomyelitis; but Abramson (5) of New York in a later article states that in his attempts to culture the virus from spinal fluid, the results have been uniformly negative. In 1200 fluids, except for evident contamination, his cultures all remained sterile and inoculation experiments on a monkey were also negative. This subject during the past year has undergone considerable discussion, the workers of the Rockefeller Institute refusing to grant that the micococcus isolated by the Chicago and Mayo Clinic works, is the etiologic agent; claiming that the small "globoid bodies" which they isolated, have thus far alone sufficed to produce typical poliomyelitis in monkeys by intracerebral inoculation. Rosenow's work on pleomorphism of bacteria has led to a possible solution, in that it has been found that the diplo- and streptococcus forms may change under certain cultural conditions into the globoid forms. The question has not been definitely settled and further evidence will be awaited with interest.

The study of cerebrospinal meningitis in the army camps in this country have shown among other things, that a fluid with positive bacterial findings is frequently obtained early in the disease by resorting to two punctures at an interval of a few hours; the first being sterile and clear while the second contains cells and the meningococcus. This is explained by assuming that the infection at first within the skull, reaches the meninges of the cord by direct extension, and removal of the clear fluid from the spinal subarachnoid space allows the infected fluid from above to reach the spinal area much earlier than would otherwise occur.

It is thought by doing the double puncture an earlier diagnosis may be reached.

The protein bodies present in cerebrospinal fluid are mainly globulins and albumose. Always present in traces in normal fluids, demonstration of their presence in excess is useful as indicating pathologic conditions of the nervous system. The test for protein excess have been most commonly called into use in luetic cases, but should be used in all fluids examined. In acute cerebro spinal meningitis, due to the meningococcus, the results of tests for protein excess have been used as a guide to therapy; the serum administration being continued until protein excess has disappeared.

Of the numerous tests which have been devised, probably the one using butyric acid and NaOH solution as advised by Noguchi is most commonly used. A saturated solution of ammonium sulphate is a useful re-agent and simple in application, as used in the phase I reaction of Nonne. In the Ross-Jones method this solution is used as a contact test. Kaplan advises a modification in which he combines the butyric acid and ammonium sulphate tests. In his method by reducing the cerebro spinal fluid in varying dilutions a quantitative estimation of the excess may be made.

The use of the colloidal gold test and its application to diseases shown by changes in the cerebrospinal fluid, dates from 1912 when the subject was first presented by Lange. Since that time both the technic of the test and method of preparation of solutions have been thoroughly reviewed, so that at present we have a standard technic and accepted formula for reading results. The originator concluded that the test was a specific one in syphilis of the nervous system, but this has not proved to be the case; though the most clearly defined curve is obtained in cases of paresis. The requisites for its successful application are a cerebrospinal fluid entirely free from blood, absolutely clean glassware and a properly prepared colloidal gold solution. It is probably more delicate than the Wassermann and furnishes more reliable findings than tests for protein excess or the cell count. It may be considered as the best guide for prognosis during treatment tending to become negative in a regular and constant manner in cases responding favorably.

Fordyce ([6]) states that as a rule there is a parallelism between this and other positive findings in the fluid, but at times it is the only positive reaction; the Wassermann, cell count, etc., being negative, yet the case clinically suggesting lues of the nervous system. He considers its greatest value is in distinguishing between paresis and conditions simulating it, and also as a prognostic aid in tabes showing no mental impairment. Should such a case give a typical paretic curve, a prognosis of later development of paresis may safely be ventured.

The reaction occurs according to three types or zones: First, the paretic type or Zone I, with complete precipitation and water clear solu-

tion, the maximum change in dilutions of 1-10 to 1-640; typical readings in this Zone being obtained in cases of paresis; second, the luetic type, or Zone II, with partial color change, being most marked in dilutions of 1-40 to 1-160 and found in secondary stage syphilis, poliomyelitis and tuberculous meningitis: Third, the meningitic type, or Zone III, showing partial color change, being maximum in dilutions beyond 1-160 and found chiefly in acute meningitis.

The Wassermann reaction on the spinal fluid is often of the greatest value. It should certainly be done in all cases of nervous disorders giving a positive serum Wassermann, and in such cases with a negative serum Wassermann in which the etiology can not be otherwise clearly established. The real diagnosis in many "neurasthenic" cases could be cleared up by a complete spinal fluid examination, including a Wassermann. The quantity of fluid used in performing a Wassermann should be considered. Formerly it was customary to use twice the amount of spinal fluid as of blood serum, but is now considered advisable to use up to ten times the quantity as of serum before a sample is reported as negative. Those using these larger amounts agree that there is shown no tendency to bind complement in non-luetic cases. In the control of treatment the clinician will often be misled, should he rely simply on the fact that a negative serum Wassermann has been obtained. In many instances it has been shown that cases with blood serum Wassermann giving fixation only with cholesterinized antigen or reported as a plus I positive, have been clearly positive with the spinal fluid Wassermann. In advising as to discontinuance of treatment it should be known that the cerebrospinal fluid has lost its pathologic manifestations as shown by a complete examination.

The four examinations to which each spinal fluid presented for study should be subjected, are: The cell count; protein excess determination including a quantitative rating; the colloidal gold test, and Wassermann reaction.

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3. Kasahara, American Journal Dis. of Children, Feb., 1917.
4. Nuzum, Journal A. M. A., Nov. 11, 1916.
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THE PATHOLOGICAL SIGNIFICANCE OF ROENTGENOLOGICAL AND HEMATOLOGICAL FINDINGS IN TUBERCULOSIS

By

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(Read before the Southwest Medical and Surgical Association, Albuquerque, Dec. 8th, 1917.)

After seven years' work, we feel reasonably confident in interpreting certain features of the pathology of pulmonary tuberculosis from the radiograph. For the past four years, we have combined the X-ray and hematological methods in our efforts to draw correct conclusions regarding the pathology present.

We have sought to develop a comprehensive laboratory technic for the determination of the pathological and immunity processes in a tuberculous patient. We believe it is the function of the clinical pathological laboratory to determine, as far as possible, the nature and extent of pathological changes. In pulmonary tuberculosis, the laboratory should take a large share in determining the character, activity, and extent of the disease processes, as well as the nature of the tissue responses upon which the patient must depend for recovery. We have found that the tissue changes, shown by the roentgenogram, and the information given by blood and serum examinations, viewed in the light of the clinical course of the disease in the immediate past, present a pathological summary of the disease which can be secured in no other way. Therefore, our routine pathological examination of a tuberculous patient includes sputum, urine, differential blood counts, complement fixations, reactions for tuberculosis and syphilis, and roentgenogram of the lungs.

Sputum and urine examinations will not be discussed in this paper, except to say that failure to mention them is not to be taken as evidence that we minimize their importance.

Much has been written on blood counts, and we will, very briefly, present only our interpretation of the lymphocyte percentage and the Arneth Index, believing that the simplest interpretation is the most acceptable to the clinician. Prof. Gruner, of McGill University, invites us to imagine the blood cells to be the citizens of a commonwealth, those in the blood and lymph vessels being the individuals traveling from place to place on the streets and highways, at other times being found in the tissues (factories, offices and dwellings). Following out this simile, the leucocytes of the blood stream constitute only a very small percentage of the total wandering cells of the body. An alarm or stimulus of almost any sort will cause the individuals to pour into the blood stream or highways

of the body (e. g., a digestion leucocytosis). The blood leucocytes may be looked upon as the body's standing army on a peace footing. In case of sudden infection, the increase in leucocytes may be regarded as a call upon the military reserves, these cells returning to their ordinary lives when the foreign invasion has been repelled.

In a persistent infection, like tuberculosis, where the body tissues are subjected to a long-continued warfare, it becomes necessary for the organism to enter into the serious business of training a permanent army of intensive fighters—in this case made up of the mononuclear leucocytes or lymphocytes. By estimating the army strength through the total white count and then ascertaining the relative number of cells specially trained to fight tubercle bacilli, we form some idea of the ability of the patient to resist an invasion by tubercle bacilli into new tissue. For example, if the total leucocyte count is 8000, we may safely assume that the organism has not yet felt the need of calling out reserve cells, and if we find that 40 per cent of the leucocytes are mononuclears, we can be reasonably certain that this specially trained army is holding its own and keeping the disease in check.

The interpretation which we have come to place on the Arneth Index is different from that usually described. The Arneth differential was designed to be a census of the adolescent polynuclear leucocytes, being based on the biological observation that the neutrophile polynuclear, originally, has a single nucleus, this breaking up, as the cell ages, into multiple nuclei, so that the number of nuclei indicates, roughly, the age of the cell. By observing the cells and classifying them according to whether they contain one, two, three, four or five nuclei, and then adding together those with one, those with two, and half of those with three nuclei, we obtain, for each 100 cells, a figure which is called the Arneth Index. For normal or healthy individuals, this figure should lie between 50 and 60, meaning that from 40 to 50 per cent of the polynuclear cells survive to reach adult life. As this Index rises, it means that more cells are destroyed young. The same economical condition which would face a country endeavoring to maintain a fighting army in active warfare, while back in the big centers of industry only 15 to 20 per cent of the people lived to reach adult life, would face a tuberculous patient whose Arneth Index is 80 or 85.

We have always considered that a patient's *general* resources against destructive processes is to be gauged by the Arneth Index while his *specific* fighting power against tuberculous invasion is to be estimated by the lymphocyte percentage. Correlating the two counts would give us four possible conditions:

(1) With the lymphocyte percentage falling below 30 and the Arneth Index rising above 65, the patient has both an insufficient fighting army and poor resources from which to recoup that army.

(2) A lymphocyte percentage rising well above 30 and an Arneth Index falling toward 50 means that there is a sufficient fighting army at the front, and that there are excellent economical resources back of that army—which means ultimate victory.

(3) A lymphocyte percentage above 30 and an Arneth over 65 means that, while the fighting force is at present satisfactory, the resources back in the industrial centers have become disorganized, in which case the fighting army must soon feel the effect.

(4) A lymphocyte count below 30 and an Arneth which remains 60 or below, means that the fighting force has been temporarily depleted, but there are sufficient powers of reorganization to bring that army back to the desirable strength, if these powers are properly conserved.

The complement fixation reaction has added a valuable adjunct to our laboratory methods of diagnosis, as well as to the effort to make a comprehensive pathological survey. Mr. Boynton's contribution on his work with this reaction has appeared in a previous issue of this Journal (1).

We wish simply to emphasize, here, the significance of the negative reaction when there is known to be an active tuberculosis present. We believe that this finding will prove to be the most valuable feature of this laboratory test.

There is no need to discuss, further, the value and methods of interpretation of the radiograph in pulmonary tuberculosis. Numerous writers, besides the author, have covered this subject thoroughly and convincingly.

In order to demonstrate our co-ordination of the roentgenographic findings, the complement fixation reactions, and the differential blood counts, in a pathological interpretation of the individual case, six records have been selected from a file of hundreds. Details, of necessity, are omitted, and only conclusions are here presented.

Case 1—Referred from Bisbee, Ariz., with diagnosis of tuberculosis. Physical examination made by a competent physician who stated the physical signs to be compatible with an active tuberculosis. Sputum was negative and the report on the roentgenogram was as follows: "Patient shows a diffuse mottled sclerosis through middle portion of left lung with less marked shadows in middle and lower right lobes. There is a well-defined dilated aorta. The pathological picture resembles that of lues rather than tuberculosis." Leucocyte count was 10,000, with 27 per cent lymphocytes and Arneth of 59. Tb. fixation was negative and Wassermann positive. Our final report was that this was a diffuse luetic pulmonitis uncomplicated by tuberculosis, and patient was placed on salvarsan therapy.

Case 2—Referred for X-ray examination of lungs and reported on as follows: "The roentgenogram shows well advanced tuberculous invasion into the upper right lobe, with fluid in right base. In the upper part of the lower left lobe is a well-defined shadow which is not characteristic of tuberculosis and we would suggest a Wassermann reaction." The blood findings were a positive tb. fixation and three plus Wassermann. The pathological report was a tuberculosis of the upper right lobe —active, with hydrothorax of right chest and syphilis of lower left lobe.

Case 3—Child. Patient was sent for radiograph and reported on as follows: "Abnormal densities at each hilum, with some upspreading infiltration, probably active incipient tuberculosis." This case illustrates a class in which we cannot be certain, from the radiograph alone whether the condition is active or not; the physical findings in this case did not clear up this doubt. However, there was a typical blood picture of early tuberculosis—lymphocytes 42 per cent, Arneth of 60, and completely positive tb. fixation, so that there wsa no longer any hesitation in making a pathological report of an incipient tuberculosis, invading from a latent hilum infection, with good general and specific resistance.

Case 4—Radiographed with the following report: "Old calcified areas at right root; recent active extensions into the upper and middle right lobes; more extensive active invasion of the upper left lung." The tb. fixation was negative. This reaction was not needed for diagnostic purposes, as both the physical signs and the X-ray shadows showed, conclusively, that there was active tuberculosis of three lobes of the lung. However, the negative reaction had a definite pathological significance, meaning that, along with the extensive pulmonary invasion, the blood stream has been swept clean of soluble anti-bodies. It now becomes important to know the status of the fighting army at the front and the condition of the resources back of that army—as shown in the differential counts. The total count was 21,000; the lymphocyte percentage was 22, and the Arneth Index was 63. The organism has called out the reserves, but the percentage of trained cells is dangerously low, although the economical resources are good. From a military standpoint, the situation is a simple one, and tuberculosis is certainly a biological warfare.

Case 5—Sent to the laboratory with information that patient was once tuberculous but present findings are slight and, apparently, not sufficient to explain a recent slump. Both Wasserman and tb. fixations were negative. Leucocyte count was 15,000, only 17 per cent of which were mononuclears; the Arneth Index was 85. Here was a serious situation, if tuberculosis is present, because with the immunological resources at such a low ebb, we would expect more involvement than the physical signs indicate. The roentgenogram showed, very graphically, a diffuse, generalized, active tuberculosis of both lungs, evidently having

but recently spread. This case illustrates the observation that acute, diffuse tuberculosis of both lungs usually will not be detected by physical signs. On the other hand, the roentgenographic picture is very startling.

Case 6—Patient in the supposedly arrested class, showing X-ray evidence of satisfactory fibrosis, which are borne out by physical signs and general good health. In spite of the good general condition, he shows a lymphocyte count which will fluctuate between 25 and 35, and an Arneth between 50 and 60. He will have occasional evidences of recrudesence over a localized area in the upper right lobe. A recent pathological survey, included the roentgenogram referred to, positive tb. fixation, 25 per cent lymphocytes and an Arneth Index of 50, with a few rales in the lung. The pathological conclusion from this would be that this patient must maintain unceasing vigilance against an enemy whom he has not entirely overcome but whom he, as a rule, successfully resists.

Recently, in an attempt to make the pathological reports of more practical value to the busy physician, we have attempted to co-ordinate the foregoing methods by means of a numerical table which is intended to represent the *Resistance Index* of the patient at the time of examination. By careful compilation of work covering several years, we have assigned to the various clinical conditions of the patient, as revealed by the X-ray or physical examination, or both, values on a percentage basis. The lymphocyte percentages and Arneth Indices have, likewise, been graded, and values have been assigned to four possible results in the tuberculosis complement fixation reaction. The following table will show these values:

X-Ray Reading or Physical Exam.	Lymph. %	Arneth Index	Comp. Fixation.
100%—Normal Chest	40%—100	55 Ind.—100%	100%—Negative, without active Tb.
80%—Slight Involv. (inactive)	38%— 90	60 Ind.— 90%	
	35%— 80	65 Ind.— 80%	75%—Positive, without active Tb.
70%—Mod. Involv. (inactive)	32%— 70	70 Ind.— 70%	
60%—Slight Involv. (active)	30%— 60	75 Ind.— 60%	50%—Positive, with active Tb.
	27%— 50	80 Ind.— 50%	
50%—Adv. Involv. (inactive)	25%— 40	85 Ind.— 40%	25%—Negative, with active Tb.
40%—Mod. Involv. (active)	20%— 30	87 Ind.— 30%	
	15%— 20	90 Ind.— 20%	
30%—Adv. Involv. (active)	10%— 10	95 Ind.— 10%	
20%—Acute Tb.....			
10%—			

By selecting the appropriate percentage figures for the respective laboratory results, we obtain an average which the practitioner may consider to be the *Resistance Index* of his patient.

For example, Case 4, cited above, gives the following results:

Moderately Advanced, active, clinically and by the X-ray showing	40%
Lymphocytes 22%	35%
Arneth Index of 63	85%
Negative Fixation with active tb.	25%
Total	185%
Divided by 4—gives average of	45%

This figure (45) represents the Resistance Index of this patient at the time of examination; if this patient is going to improve, the first sign of it will be in the blood picture and, consequently, in the index figure.

We tabulate, below, fifty cases illustrating how very closely the Resistance Index corresponds to the subsequent course of the disease. In this table, the physician's prognosis has about the following significance: "Excellent" means that arrest of the disease is the natural outcome; "good" means that arrest was expected under proper regimen and care; "fair" means that chances for improvement were about even; "poor" means that improvement was not expected; "very poor" means that rapid progress and death was inevitable. The lymphocyte percentages and Arneth Indices are given as found in the laboratory; the Tb. fixation result is stated, the significance of this depending on the stage and activity of the disease. The averages of the corresponding percentages (but not the percentages themselves) are found under "Res. Ind." Under "Remarks" the subsequent history of the patient is briefly summarized.

This particular series of patients is chosen from a list of about 400, to whom this method has been applied, because this list includes the first patients so examined and, consequently, a longer time has elapsed in which to observe the progress of the disease, thus giving a better idea of the value of this method of estimating its probable course.

No.	Physician's Prognosis	Ly. %	Arn. Ind.	Tb. Fix.	Stage of Dis.	Res. Ind.	Remarks
1	poor	20	74	pos.	M. A. Act.	45	No improvement
2	poor	21	81	pos.	M. A. Act.	40	No improvement
3	good	26	53	pos.	Sl. Act.	65	Improving
4	good	41	59	pos.	M. A. inact.	85	Improving
5	good	32	80	pos.	Sl. inact.	70	Improving
6	fair	24	51	pos.	M. A. Act.	60	Improving.
7	good	32	51	pos.	Sl. inact.	75	Improving.
		(Examined during a temporary slump)					
8	good	29	81	neg.	M. A. Act.	40	Did not improve.
9	fair	22	65	neg.	M. A. inact.	65	Stationary.
10	good	37	59	pos.	Sl. Act.	70	
11	good	25	64	pos.	Sl. Act.	60	
12	excellent	30	54	neg.	Sl. inact.	85	Good condition.
13	excellent	34	50	pos.	Sl. inact.	85	Good condition.
14	good	31	59	pos.	Sl. act.	65	
15	excellent	31	68	pos.	Sl. inact.	70	Good condition.
16	good	26	42	pos.	Sl. act.	65	Improving
17	good	26	54	neg.	Sl. inact.	80	Good condition.
18	good	26	42	pos.	Sl. act.	65	Improving.
19	poor	21	71	pos.	Adv. inact.	55	Up and down.
20	fair	34	68	pos.	M. A. Act.	65	
21	poor	21	72	pos.	M. A. Act.	50	
22	very poor	13	78	pos.	Acute	35	Dead.
23	poor	25	76	pos.	M. A. Act.	50	
24	good	19	68	neg.	M. A. Act.	40	No improvement
25	good	31	65	neg.	M. A. inact.	80	
26	excellent	43	51	neg.	S. inact.	95	Good condition.
27	fair	22	63	neg.	M. A. Act.	45	
28	good	52	65	pos.	M. A. Act.	70	
29	excellent	27	50	neg.	Sl. inact.	85	Good condition.
30	very poor	15	82	pos.	Adv. act.	40	Failing.
31	good	26	53	pos.	Sl. act.	70	(same as No. 16)
32	very poor	13	75	pos.	Adv. act.	40	Failing.
33	excellent	47	55	pos.	Sl. inact.	85	Improving.
34	very poor	15	80	pos.	Acute	35	Failing.
35	fair	24	68	pos.	M. A. Act.	50	Stationary.
36	poor	21	77	pos.	M. A. Act.	45	
37	very poor	23	78	pos.	Adv. act.	45	Failing.
38	excellent	31	56	pos.	Sl. inact.	80	Good condition. (same as No. 12)
39	good	31	82	neg.	M. A. inact.	65	
40	excllent	29	58	pos.	S. inact.	75	
41	very poor	19	78	pos.	Adv. act.	50	
42	very poor	28	79	pos.	Adv. act.	45	Failing.
43	good	21	57	neg.	M. A. Act.	50	(same as No. 24) Stationary
44	excellent	41	53	neg.	Sl. inact.	95	(same as No. 13)
45	excellent	34	74	neg.	Sl. inact.	80	Good condition.
46	very poor	24	84	pos.	Adv. act.	40	Failing.
47	good	34	80	pos.	Sl. act.	60	
48	excellent	42	61	neg.		90	Good condition.
49	excellent	32	59	neg.	Sl. inact.	85	(same as No. 29)
50	very poor	22	68	pos.	Adv. act.	45	Failing.

CONCLUSIONS:

(1) Correlation of the X-ray findings with the blood picture gives a much better insight into the pathology of tuberculosis than either of these methods singly.

(2) By further correlating these findings with the physical examination and general knowledge of the patient, the clinician may obtain a fairly accurate immediate prognosis.

REFERENCE:

(1) Southwest Medicine, Jan., 1918.

ARIZONA STATE MEDICAL ASSOCIATION

Announcements of Annual Session

Owing to the heavy drain made by war demands on the medical profession of Arizona, the place of meeting has been changed from the Grand Canon to Phoenix. The dates of the meeting will be April 24th and 25th.

On account of the enforced change, the President has ordered that no provisions be made for entertainment or social gatherings, so that this meeting will be unique, in that it will be devoted entirely to business and scientific papers. In the evening the visitors will be allowed to rest.

Below is the provisional program for the Scientific Sessions:

"An Interesting Experience in the Feeding of Milk from Tuberculous Cows," Dr. Mark A. Rodgers, Tucson.

Subject to be announced later, Dr. Willard Smith, Phoenix.

"Syphilitic Aortitis," Dr. Roy E. Thomas, Phoenix.

"Indications for Mastoidectomy," Dr. J. J. McLoone, Phoenix.

"Lessons from the Draft Examination," Dr. F. H. Redewill, Phoenix.

"The Thermic, Mechanical and Chemical Effects of the Various Electric Modalities and Their Therapeutic Value," Dr. W. W. Wilkinson, Phoenix.

To be announced. Dr. A. D. Wilson, Prescott.

"The Survival of the Unfit," Dr. Mary L. Neff, Phoenix.

"Some Statistics Gathered from Physical Examination of Employees," Dr. R. J. Stroud, Gleeson.

"Abortion," Dr. Win Wylie, Phoenix.

"Dakin's Solution and Chlorazene Paste, with Report of Results in the United Verde Hospital," Dr. A. C. Carlson, Jerome.

"X-ray Diagnosis of Pathology in the Lumbo-Sacral Region," (lantern slide demonstration), Dr. W. Warner Watkins, Phoenix.

The Association will welcome visitors. The Committee on Program has not felt justified in inviting papers from nearby states, owing to the probable small attendance at the meeting.

SUIT AGAINST DR. JOHN W. FLINN, OF PRESCOTT, ARIZ., DISMISSED

The following extract from the Prescott Journal-Miner of March 14th, 1918, will be of interest to the medical men of the southwest:

"Judge Crosby, occupying the bench during the trial of the action of McCarthy vs. Pamsetgaaf, Inc., yesterday evening halted the case at the conclusion of the day's session and directed the jury to return a verdict for the defendant, alleging that the plaintiff had entirely failed to make out a case against Dr. Flinn, head of the defendant institution. McCarthy in his complaint had alleged that Flinn had been guilty of malpractice, and sought to collect damages amounting to $42,230. Attorney Russell, representing the plaintiff, stated yesterday evening that the case would be appealed to the Arizona Supreme court.

"The trial was opened on Monday morning. Only three witnesses were examined during the entire two days, these being the plaintiff, McCarthy, Dr. Flinn and Dr. J. B. McNally. McCarthy occupied the stand most of yesterday morning. He added some details regarding the operation which Dr. Flinn caused to be performed on him at the Mercy hospital. McCarthy's efforts were directed toward trying to prove that Flinn had failed to make a quick and correct diagnosis of his case and also that the physician was at fault in subjecting the plaintiff to the so-called "sun cure" during the days that he was convalescent. McCarthy's statements were that Flinn had retarded the recovery of his patient rather than speeded it up by reason of the treatment given the plaintiff after he left the Sisters' hospital.

"Dr. McNally, who performed the operation, testified to the conditions found at the time the opening was made. He said that the appendix was in a tuberculous condition, and that in his opinion, Flinn had used the proper methods of treating the case, both before and after the operation. The conditions present prior to the operation might have come from any of four varieties of internal ailments, he said, and not until the appendix had been exposed by the operation were the physicians exactly certain just which of the complications had made the operation necessary.

"In directing the jury to return a verdict for the defendant, Judge Crosby stated that there were three primary reasons for such action. In the first place, the plaintiff had failed to show that his case could have been diagnosed any more quickly than was done by the defendant; second, that the plaintiff had failed to prove that he had suffered to any undue extent as the result of the alleged carelessness on the part of the defendant, and third, that the sun cure, to which he was subjected by Dr.

Flinn, was by no means an improper procedure in such cases, and that the highest medical authorities of today would have approved of the treatment.

"The court's ruling gives Judgment for the court costs against the plaintiff, although the judgment will not cover the attorney's fees on the defendant's side. Dr. Flinn was represented by Attorneys Anderson and Ellis and R. E. Morrison."

This is the first case to be handled by the Association under its plan of Medical Defense, and the outcome of the case will be very encouraging.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., SOUTHWESTERN MEDICINE, REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912.

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

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(If there are none so state.)

2. That the owners are: (Give names and addresses of individual owners, or, if a corporation, give its name and the name and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock.)

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Sworn to and subscribed before me this 18th day of October, 1917.

(SEAL) J. RUTHVEN BRISCOE.

Form 3526.—Ed. 1910. (My commission expires June 1st, 1919.)

Note.—This statement must be made in duplicate and both copies delivered by the publisher to the postmaster, who shall send one copy to the Third Assisant Postmaster General (Division of Classification), Washington, D. C., and retain the other in the files of the post office. The publisher must publish a copy of this statement in the second issue printed next after its filing. c5—6012

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All articles must be made exclusive to this journal. Reports of Society Meetings are asked for from the Secretaries.

Items of interest, with the name of the sender will be acceptable.

Books for review should be sent to The Editor, care of the Medical Library, 320 Roberts-Banner building, El Paso, Texas.

Advertisements of proprietary medicines must have had the preparations approved by the Council of Pharmacy, A. M. A.

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EDITORIALS

CURRENT COMMENT

Referring to the article by Symmers and others, in the Journal A. M. A., Feb. 2nd, 1918, on the "Comparison between the Wassermann Reaction and Autopsy Findings."

This article is very interesting in that it is utterly misleading to the general practitioner.

In the first place, they will find little agreement with their statement that naked eye observations as to pathology are more reliable than the blood reaction in determining the presence or absence of syphilitic infection.

In the second place, they will find little or no agreement with their interpretation of results based entirely on cholesterinized antigen. Their table, while not giving the percentage of inhibition with the cholesterinized antigen, evidently contains a vast majority which did not give com-

plete inhibition. Few laboratory workers are willing to report a partial inhibition with cholesterinized antigen, uncontrolled by another antigen, as a positive Wassermann.

Re-analyzing their cases, as reported, on the basis of the recognized method of interpreting Wassermann reactions, we have the following: There are 99 cases.

The first 21 cases should have been recorded as negative, evidently showing only partial inhibition of hemolysis with cholesterinized antigen. In these 21 cases, seven had signs of syphilis at autopsy, which is about the usual proportion.

There are 63 cases which should have been reported as one plus positive or doubtful, evidently not giving absolute inhibition with cholesterinized antigen. Of these 35 were syphilitic as shown by autopsy findings. The correct interpretation of these results would be that 29 non-syphilitics gave partial inhibition with cholesterinized antigen, an every day phenomenon in any laboratory; also that 34 syphilitics failed to give absolutely positive Wassermann reactions, a very common experience; this simply calls for retesting.

Out of the list of 99 cases, there are only 15 which reacted positively to two antigens, and these are the only ones which are entitled to be called positive Wassermann reactions. Of these fifteen, eleven were syphilitic. In four, syphilis was not found by naked eye observation, but carcinoma was present. It would be interesting to know the histopathology of the carcinomatous areas, as there could easily be an intermingling of syphilis and cancer.

This leaves only one case which was clearly Wassermann-positive and in which the authors could absolutely exclude all naked eye evidence of syphilis, and, in all deference to the eyesight of the autopsy pathologist, we would like to see certain portions of that body submitted to Warthin or some other painstaking, high-powered microscopist.

—W. W. W.

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BOOK REVIEWS

The Principles of Mental Hygiene. By William A. White. MacMillan Co., New York, 1917. Price $2.00.

It is not so long ago that the calling in of a specialist by the family doctor was an indication to the patient that the case was serious. There was first an examination in the sick room, the ill man trying to extract some meaning from the learned terms employed. Then, courteous and smiling, the doctors withdrew to consult together, their verdict being given to the family—not the patient.

Today, a cooperative diagnosis is aimed at, and, weighed in the general consensus of opinion is the auto diagnosis evolved from the sick man himself by the skilful psychoanalyst. The radiographer, ophthalmist, rhinologist, internist, are all taken into the consultation, and, finally, by a skilful sympathetic questionnaire, the patient is led to speak of or recall many events or deeds seemingly foreign to, but, in reality, elucidating his physical complaint. In the helpful little volume by Dr. W. A. White, a rough list of some forty morbidities, all referable to a mental condition, are given, the necessity for psychoanalysis and therapy being clearly shown by its direct beneficial influence on the individual, and, indirectly, through him, on the community, the state and the nation.

Unfortunately, the learned layman has mixed up psychotherapy with hypnotism, and imagines a species of inquisition in which the patient involuntarily uncovers his past. (The past, curiously, generally meaning evil deeds.) Whereas the analysis is voluntary and for the purpose of "reconstructing the psychological history of the patient so far as that history bears upon the formation of the symptoms." It is invariably found that, "the symptom represents, symbolizes, a form of instructive activity which belongs to the period of infancy and should have been renounced as the child grew to adulthood, but which, because of some special emphasis, has been retained.

The chapter on the Neuroses and Psychoanalysis is one of the best. It is as a family album to the layman wherein he may see himself as well as his children and relations, and more wisely judge their failings. The volume is more lucidly explanatory of that which Psychoanalysis is than any I have come across and is as useful to the socialist as the doctor.

—D. W.

Military Surgery. By Dunlap P. Penhallow, M. D., Harvard, Chief Surgeon American Woman's War Hospital, Paignton, England; Captain Medical Corps, Mass., National Guard, with introduction by Sir Alfred Keagh. Original drawings by the author. Oxford University Press, American Branch, New York, 1916.

It is unintentionally significant that THE END is no longer printed on the last page of medical books, for, indeed, there seems no end to war and the improved surgery it evokes. Bell, Larrey, Guthrie and such as they look down from the heavenly battlements on gore-drenched Europe must rejoice that their improvements, now deemed mistakes, have been rectified. Even in the carbolic drenched atmosphere of 1870, amputations were done by the thousand, "probing" for bullets was not very succcessful, hospital gangrene had not been conquered, and "the mitrailleuse bullet and the needle gun wounds nearly always necessitated amputation."

Possibly, in another century, a ghostly Penhallow will join in the smile of a living confrére reading the "Military Surgery" but we who may soon be summoned to make practical use of his advice, can honestly say that there may be a wiser counsellor but we do not know him. He speaks from personal experience, supplemented by reading and study, his debt to modern literature being frankly acknowledged.

Especially good is the chapter on Wounds of Head, Face and Neck because he foresees the possible consequences of even a slight one. The section on Wounds of the Nerves is particularly usful and interesting just now in view of the wonderful advancement in nerve surgery. The Conduction of Nervous Impulse by Professor Keith Lucas is a companionable monograph to this section.

The hurried doctor with no more time for study in France will find the pictures tremendously useful in fixing facts in his mind, and, if the author wants to render his confréres more grateful, he might advantageously make a brief **vade mecum**, comprising some of the chief points, for those going to Europe.

—D. W.

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